

SHIP PRODUCTION COMMITTEE
FACILITIES AND ENVIRONMENTAL EFFECTS
SURFACE PREPARATION AND COATINGS
DESIGN/PRODUCTION INTEGRATION
HUMAN RESOURCE INNOVATION
MARINE INDUSTRY STANDARDS
WELDING
INDUSTRIAL ENGINEERING
EDUCATION AND TRAINING

May 1999
NSRP 0550
N1-94-2

THE NATIONAL SHIPBUILDING RESEARCH PROGRAM

Environmental Training Modules Module 10 - Environmental Training for Subcontractor Personnel

U.S. DEPARTMENT OF THE NAVY
CARDEROCK DIVISION,
NAVAL SURFACE WARFARE CENTER

in cooperation with
National Steel and Shipbuilding Company
San Diego, California

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAY 1999		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE The National Shipbuilding Research Program, Environmental Training Modules Module 10 - Environmental Training for Subcontractor Personnel				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Surface Warfare Center CD Code 2230-Design Integration Tools Bldg 192, Room 128 9500 MacArthur Blvd Bethesda, MD 20817-5700				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 40	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

DISCLAIMER

These reports were prepared as an account of government-sponsored work. Neither the United States, nor the United States Navy, nor any person acting on behalf of the United States Navy (A) makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness or usefulness of the information contained in this report/manual, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or (B) assumes any liabilities with respect to the use of or for damages resulting from the use of any information, apparatus, method, or process disclosed in the report. As used in the above, "Persons acting on behalf of the United States Navy" includes any employee, contractor, or subcontractor to the contractor of the United States Navy to the extent that such employee, contractor, or subcontractor to the contractor prepares, handles, or distributes, or provides access to any information pursuant to his employment or contract or subcontract to the contractor with the United States Navy. ANY POSSIBLE IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR PURPOSE ARE SPECIFICALLY DISCLAIMED.

ENVIRONMENTAL TRAINING MODULES

MODULE 10

ENVIRONMENTAL TRAINING FOR SUBCONTRACTOR PERSONNEL

Prepared by:

DM Austin Environmental Consulting, Inc.

May 1999

NSRP 0550
(N1-94-02)

TRAINING MODULES OVERVIEW

Executive Summary and User s Guide (NSRP 0540) Gives an overview of the 10 module set of environmental training modules, plus key issues involved in training in general. Instructions are supplied for how the modules can be modified to suit individual shipyards, as well as hardware and software requirements.

Module 1 (NSRP 0541) **Good Environmental Practices**

Content: Craft/trade-specific training on items that workers must deal with on a regular basis – material handling, labeling, waste generation/minimization, requirements awareness.

Recipients: New employees on arrival, and existing workers as a refresher.

Module 2 (NSRP 0542) **Environmental Practices for Specific Craft/Trade Groups**

Content: Specific training on air, hazardous materials, waste minimization, and related environmental considerations, with a focus on the generator personnel and their individual practices and procedures. Emphasis on those personnel likely to encounter a high incidence of problems during their regular duties.

Recipients: Specific craft/trade groups of workers.

Module 3 (NSRP 0543) **Shipyard Incident Response Training**

Content: Detailed presentation of response requirements specified by OSHA. Basic ingredients of a viable program for a shipyard – what is required and how to reach a satisfactory state of readiness. Includes specific duties of all participants, as well as how to ensure coordination and a common focus. This Module will provide the shipyards with an in-house capability for conducting this important training.

Recipients: Environmental Manager, Environmental Staff Personnel, Safety Engineer, Safety Personnel, Fire Department Personnel, Laboratory Staff and Technicians, Emergency Response Coordinator, Medical Personnel.

Module 4 (NSRP 0544) **Shipyard Oil Pollution Prevention and PIC Training**

Content: Provides a detailed overview on the federal regulatory oil pollution prevention and response requirements. Also contains specific training material for those shipyard employees with designated “Person in Charge” responsibilities.

Recipients: Ship and Craft Managers and Leadmen, Environmental and Safety Department Personnel, designated Persons in Charge.

Module 5 (NSRP 0545) **General Environmental Awareness**

Content: Overview of environmental statutes and regulations affecting shipyards, including responsibilities for compliance including both civil and criminal penalties for non-compliance. Includes an overview and explanation of environmental processes - how laws are formulated, the role of environmental groups, consultants, advisers.

Recipients: Senior Management

Module 6 (NSRP 0546) Technical Overview of Environmental Statutes and Regulations

Content: A general but in-depth overview of all environmental statutes and regulations with a focus on shipyard interests, and emphasis on the technical aspects of the requirements.

Recipients: Environmental Managers and staff personnel.

Module 7 (NSRP 0547) Environmental Requirements of Concern to Shipyards

Content: General overview of ALL requirements as they apply to shipyards. Emphasis on technical aspects and actions needed for compliance, rather than on the penalties for non-compliance. Includes overall strategy for developing a strong environmental posture.

Recipients: Senior Management, Supervisors, Generator Personnel; all workers who interface with environmental matters.

Module 8 (NSRP 0548) Generation/Treatment/Minimization of Hazardous Waste

Content: Discussion of regulatory requirements and statutes that apply to shipyard hazardous waste activities. Stresses the high points of the laws, and how to satisfy them. Includes overview of training provided to hazardous waste operators.

Recipients: Middle-level Managers

Module 9 (NSRP 0549) Hazardous Waste Operator Training

Content: Detailed training on practices and procedures performed by hazardous waste operators. Includes reclamation techniques, safe handling practices, labeling/markings, inventory control, hazard minimization.

Recipients: Hazardous Waste Operators; helpers and assistants

Module 10 (NSRP 0550) Environmental Training for Subcontractor Personnel

Content: Briefing on environmental requirements and considerations applicable to all Subcontractor Personnel entering a shipyard environment.

Recipients: Subcontractor Personnel; visitors to a shipyard; transient personnel such as delivery agents, auditors, and oversight personnel.

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE: Explain the importance of Good Environmental Practices to all shipyard contractors.

INTRODUCTION TO GOOD ENVIRONMENTAL

PRACTICES for Shipyard Contractors: All shipyards are located at the meeting of land, air and water. This fact is driven by the nature of the work performed at, and by, shipyards. Shipyards also tend to perform work out-of-doors more often than other industries. Many of the job tasks performed by shipyard contractors may result in the release of pollution to the environment.

For example, the application of marine coatings will result in the release of Volatile Organic Compounds (VOC) to the air. VOC, combined with other pollutants and sunlight, make “smog” or ozone. Abrasive blasting often results in the discharge of metal pollutants, such as copper, lead and zinc, to the land and water. Engines on cranes and other shipyard equipment discharge air pollutants, through their exhaust systems, and soil and water pollutants, through leaks and spills of crankcase oils and lubricants.

As a result of the fact that shipyards have a high potential for pollution, and can discharge pollutants easily to the land, water and air, shipyards operators and workers and contractors have a significant responsibility to protect the environment. Consequently, shipyards here, and throughout the United States, are highly regulated by federal and state environmental authorities. It is not unusual for shipyards to be regulated by more than twenty different agencies with respect to compliance with environmental laws and regulations.

Compliance, as well as non-compliance with the environmental regulations, also imposes a significant financial burden on the company. Many man-hours and dollars must be spent to ensure that the shipyard does its best to stay within the law and prevent environmental accidents. If something does go wrong, even small incidents can cost tens of thousands of dollars in remedial actions and fines. It is even possible for a shipyard to be forced to close, with the resultant loss of employment for all of its employees and contractors, for the violation of an environmental crime.

INTRODUCTION TO GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

The purpose of integrating Good Environmental Practices for Shipyard Contractors into the shipyard is to ensure that all shipyard contractors understand both the importance of protecting the environment, as well as the necessity for complying with environmental laws. This program will provide an introductory level of environmental awareness to all contractors, upon which more detailed and task specific training can be applied.

**INTRODUCTION TO
GOOD
ENVIRONMENTAL
PRACTICES for
Shipyard Contractors
(con't)**

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE

Insure that all shipyard contractors understand their duty to comply with environmental laws and regulations that affect their operations at the shipyard.

CONTRACTOR'S DUTY TO COMPLY

Every shipyard contractor has a duty to comply with all applicable environmental requirements. This duty is built in to all subcontract agreements issued by the shipyard whereby the contractor or vendor agree to perform their task in accordance with all applicable federal, state and local laws and regulations. This duty to perform all work in an environmentally safe manner is also a moral and ethical requirement of the contractor.

In addition to the applicable federal, state and local requirements, this shipyard has environmental permits which may affect how you perform your duties at this site. For example, the shipyard may require you to keep records on your operations that are necessary to demonstrate compliance with relevant permits or may require that your equipment meets certain pollution control standards. As the requirements will vary with each contractor, the shipyard will work closely with each contractor to ensure all appropriate requirements are identified and met.

FAILURE TO COMPLY

If a contractor fails to comply with any applicable environmental requirement, the shipyard can, and will, take one or more corrective actions to ensure problems do not reoccur in the future. These corrective actions include, but are not limited to:

- Report the incident to the appropriate regulatory agencies.
- Require immediate actions by the contractor to mitigate the incident, including all costs associated with clean-up.
- The withdrawal of facility access to contractor employees whose actions, through intent or negligence, caused the incident.
- Termination of the contract for cause for failure to perform duties as required.

CONTRACTOR'S DUTY TO COMPLY

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

GET ASSISTANCE WHEN REQUIRED

Shipyard personnel with environmental and/or safety responsibilities can provide you with guidance when necessary. Please contact these persons if you need assistance or clarification concerning any environmental issue.

Remember - While conducting operations within the shipyard, it is your duty to fully comply with all environmental requirements.

**CONTRACTOR'S DUTY
TO COMPLY**

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE:

Provide a brief overview of Federal environmental statutes that impact the daily shipyard operations.

ENVIRONMENTAL LAW

Over the past 50 years, but mostly in the last 20 years, the federal government has passed many environmental laws. Most have been directed at the protection of one of the three specific media: air, land or water. Due to the shipyard's location on at the interface of the three media, almost all environmental laws affect our operations. A very brief summary of the most important federal statutes is provided below.

Act to Prevent Pollution from Ships. The Act to Prevent Pollution from Ships was enacted in 1980 to implement the agreements made at the Protocol of 1978 and the International Conference for the Prevention of Pollution from Ships of 1973. Both conventions were held in London to discuss local and international laws governing the discharge of oil and oily waste from marine vessels. In accordance with this Act, new ships must be designed to reduce the chance of oil spills and eliminate the discharge of oily waste during operation. Specific reporting of solid waste discharges and ballast releases were established, as well as specific operations, inspection and certification requirements. This Act also requires that heads of certain federal departments prescribe standards for ships under their authority, which are reasonable and practicable, without impairing the operations or operational capabilities of such ships.

Clean Air Act. The Clean Air Act of 1970 was designed "to protect and enhance the quality of the Nation's air resources so as to promote public health and welfare...." In accordance with this Act, the Environmental Protection Agency (EPA) is required to monitor air emissions and issue permits to ensure that specific air standards are met. Amended in 1990, this Act is now significantly stronger and establishes specific goals and timetables for reducing air pollutants. Federal and State agencies are making a cooperative effort to reduce pollutants at their source. To achieve compliance, market incentives and increased fines have been incorporated into this Act which encourage industry to take a proactive approach to meet and exceed these standards

Clean Water Act. The Clean Water Act of 1977 (CWA), formally known as the Federal Water Pollution Control Act, authorizes the EPA to regulate the control and prevention of surface and ground

ENVIRONMENTAL LAW

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

water pollution. The CWA addresses the regulation of both domestic and industrial wastewater. The primary tool for the management of wastewater is the National Pollutant Discharge Elimination System (NPDES). NPDES permits are issued by the EPA unless the State in which the discharge is located has been given authority by the EPA to issue permits. Permits are required for industrial activities as well as facilities treating domestic wastewater. NPDES permits usually contain limits on the quantities of specific pollutants which can be discharged from the permitted point source, as well as sampling, chemical analysis, and reporting requirements.

Comprehensive Environmental Response, Compensation and Liability Act. In response to increased public concern over the dumping of chemical wastes, Congress passed the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in 1980. This Act established a \$1.6 billion dollar fund for cleaning up old waste spill and storage sites. The purpose of this fund was to expedite the remediation of our nation's worst waste sites, while seeking compensation through litigation from the persons responsible. This fund soon proved inadequate to fix a severe and costly problem. Subsequently, the Superfund Act of 1986 was approved and contributed \$8.5 billion to the fund. While CERCLA lacked adequate funding and legal strength, it established the groundwork for determining legal liability for all those who "caused or contributed to a release of hazardous wastes."

Emergency Planning and Community Right to Know Act. The Emergency Planning and Community Right to Know Act of 1986 (EPCRA), also known as SARA Title III, requires immediate notification of State and local authorities in the event of a release of a hazardous material. Congress enacted this law to help local communities protect public health, safety, and the environment from chemical hazards. EPCRA is designed to "provide a basis for each community to develop a chemical release preparedness and planning program that suits its individual needs" and to "provide the public with the identity, quantity, location and properties of hazardous substances in the community." By establishing emergency planning and notification requirements as well as hazardous substance notification procedures, EPCRA is designed to increase community awareness and minimize the effects of authorized and incidental releases.

ENVIRONMENTAL LAW

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

Federal Facilities Compliance. The Federal Facilities Compliance Act of 1992 was designed to amend the Solid Waste Disposal Act so as to waive the sovereign immunity of federal agencies. This legislation requires federal facilities to comply with all federal, State and local hazardous waste management requirements. In accordance with this Act, federal agencies have the responsibility to take a leading role in reducing pollution and informing the public of toxic and hazardous chemicals at federal facilities. Federal agencies are no longer exempt from the fines and penalties that the EPA and States use to enforce compliance with hazardous waste laws with respect to non-governmental facilities (i.e., privately owned shipyards). Specifically, the head of each federal agency must perform an initial assessment of toxic releases and develop a plan to achieve compliance with the Pollution Prevention Act and EPCRA. Starting in 1995, federal agencies will begin submitting progress reports to the EPA. The goal of this Act is to protect human health and the environment by making the federal government accountable for its environmental record.

Federal Insecticide, Fungicide and Rodenticide Act. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) authorizes the EPA to regulate the manufacture, distribution, importation, and use of pesticides. Broadly defined, a pesticide is any agent used to kill or control undesired insects, weeds, rodents, fungi, bacteria, or other organisms. The term "pesticides" includes insecticides, herbicides, rodenticides, fungicides, nematocides, acaricides, as well as disinfectants, fumigants, and plant growth regulators. FIFRA requires pesticide manufacturers to register all active ingredients of pesticide formulations. Many types of antifoulant coatings applied to the underwater hulls of ships are classified as pesticides, and subject to federal and/or state pesticide regulations.

Hazardous Materials Transportation Act. The Hazardous Material Transportation Act (HMTA) of 1974 authorizes the Secretary of Transportation to protect the nation against the risks to life and property that are inherent in the transportation of hazardous materials in commerce. In accordance with this Act, the Department of Transportation (DOT) is authorized to issue regulations governing the safe transportation of hazardous materials in intrastate, interstate, and foreign commerce. The hazardous materials regulations include requirements for: material classification; identification and packaging; transportation and handling; and incident reporting. In 1990, the Hazardous Material Uniform Safety Act of 1990 was enacted to require training and to

ENVIRONMENTAL LAW

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

ensure safe handling of hazardous materials. This amendment to the HMTA established specific training requirements for employees who work with hazardous materials, and specified dates by which these training requirements must be satisfied.

National Environmental Policy Act. The National Environmental Policy Act (NEPA) requires federal agencies to consider the environmental impact of proposed actions in their planning and decisions. For major federal actions which will significantly affect the quality of the environment, NEPA requires federal agencies to prepare detailed statements, termed “Environmental Impact Reports” regarding such considerations and the resulting recommendations. Projects that could prompt NEPA review include: large dredging projects; constructions of major new installations; major land acquisitions; changed use of the property; construction of new sanitary landfills; and disposal of toxic substances.

Oil Pollution Act. In 1990, Congress passed the Oil Pollution Act to expand the scope of oil pollution prevention and response activities to all oil discharge facilities which pose a potential harm to navigable waters. This Act amended the Clean Water Act to augment federal authority, increase fines, and emphasize preparedness and prevention. It increased the number of regulated activities by including both transportation and non-transportation related facilities in close proximity to water sources. In accordance with this Act, the EPA required that all "substantial harm facilities" submit a local response plan for approval by February 18, 1993 or stop handling, storing, or transporting oil. This Act also provided specific guidance on how to develop response plans.

Pollution Prevention Act. The Pollution Prevention Act of 1990 established that it was the national policy of the United States to prevent and reduce pollution at the source, whenever feasible. Pollution which cannot be prevented should be recycled, and that which cannot be recycled or prevented should be treated and disposed of in an environmentally sound manner. The Pollution Prevention Act encourages source reduction of all types of waste, not just hazardous wastes. In accordance with this Act, the EPA has established an office to promote pollution prevention and assist businesses in adopting pollution prevention techniques. The EPA must consider the impact of new projects on source reduction efforts. Facilities that are currently required to file annual toxic chemical

ENVIRONMENTAL LAW

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

release inventories must now include information on their toxic chemical source reduction and recycling efforts.

Resource Conservation and Recovery Act. The Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendment Act (HSWA), authorizes the EPA to regulate the management, treatment, storage, and disposal of hazardous waste. Waste products are classified as hazardous if they exhibit the characteristics of ignitability, corrosivity, reactivity, or toxicity **or** if they are listed as a hazardous waste in the regulations. The major intent of RCRA is to promote "cradle-to-grave" management of hazardous waste, to reduce the amount of hazardous waste generated, and **to minimize** the detrimental impacts of hazardous waste on the environment. RCRA and HSWA also established standards for the management of underground storage tanks and used oil, and land disposal restrictions which encourage treatment in lieu of disposal.

Safe Drinking Water Act. The Safe Drinking Water Act (SDWA) authorizes the EPA to regulate drinking water. The EPA sets standards which must be met by all drinking water supplied to the public. The facility that supplies drinking water is responsible for ensuring that the water meets these standards. The drinking water program was established under the premise that the EPA would authorize the States to carry out and enforce the program. The requirements of the SDWA apply to all public water systems. A public water system is one which serves piped water to at least twenty-five people or fifteen service connections for at least sixty days of the year. Public water systems are divided into two categories; community water systems and non-community water systems. A community water system serves people year-round, (i.e., city or town), whereas a non-community water system serves people only a portion of the time (i.e., motel or campground). Different requirements apply to each type of water system.

Superfund Amendments and Reauthorization Act. It became apparent in 1985 that the original funding for cleaning up waste sites authorized under CERCLA was inadequate. Although 14 sites had been cleaned up, the National Priority List of sites in need of remediation continued to grow. The Superfund Amendments and Reauthorization Act (SARA) of 1986 contributed \$8.5 billion to the fund. SARA established the Defense Environmental Restoration Account (DERA) to fund the clean-up of Department of Defense waste sites. Title III of this Act established specific reporting and

ENVIRONMENTAL LAW

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

planning requirements for businesses that handle, store, or manufacture hazardous materials. Among these requirements are specific methods for reporting incidental leaks and spills, planning for emergency response, and monitoring ongoing releases. In 1991, a reauthorization approved an additional \$1.8 billion per year to the fund through 1994.

Solid Waste Disposal Act. The Solid Waste Disposal Act (SWDA) authorizes the EPA to regulate the management, treatment, storage, and disposal of solid wastes. Solid waste includes household, municipal, commercial, and industrial refuse. Solid waste encompasses hazardous and nonhazardous waste, including medical waste. Solid waste can take gaseous, liquid, or solid form. The federal regulations promulgated under SWDA focus on non-hazardous wastes, commonly known as trash or garbage. The EPA regulates solid waste collection, storage, recycling, incineration, and land disposal. The EPA requires mandatory procurement of certain recycled materials by federal government agencies. State and local authorities also regulate solid waste disposal.

Toxic Substance Control Act. The Toxic Substance Control Act of 1976 (TSCA) was enacted by Congress to test, regulate, and screen all chemicals produced or imported into the U.S. Most environmental regulations address problems associated with the management of hazardous substances after the substances have served their useful purpose (i.e., how do we dispose of the waste?). TSCA addresses substances while in use, and in some cases, prohibits their manufacture or importation. A major intent of this Act is to prevent problems before they occur, rather than solve them at the "end of the pipeline." Manufacturers of new chemicals must provide the EPA with 90-day advance notification of their intent to manufacture, unless excluded by TSCA. Significant new uses for existing chemicals require the same notification. In addition to these general requirements, TSCA addresses specific hazardous chemical substances. These substances include polychlorinated biphenyls (PCBs), which are commonly used as dielectric fluids in transformers and capacitors; asbestos, which is used in applications requiring heat resistant material; chlorofluorocarbons (CFCs) used as refrigerants; certain metalworking fluids; certain water treatment chemicals; dioxins; and furans.

Shipyards are subject to literally thousands of environmental regulations. It is not your job to know them all, or how they may

ENVIRONMENTAL LAW

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

apply in every situation. However, it is everyone's job to know how their own particular work tasks and job processes must be performed in order to both protect the environmental and the economic viability of the shipyard.

**ENVIRONMENTAL
LAW**

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE

Maintain a clean and organized shipyard to minimize the likelihood for accidental pollution. This means that the entire shipyard, as well as your immediate work area, should be kept clean and well organized.

KEEP YOUR WORK AREA CLEAN AND ORGANIZED

Keeping your work area clean and organized creates efficiency, allowing you to perform your duties without immediate distractions. It further allows for other subsequent shift workers to complete their tasks without housekeeping problems. Ultimately it makes your job easier.

"Good Housekeeping" is the practice of maintaining a clean, well-defined work space. It means keeping the immediate area where you perform your work free of trash, debris, and other similar materials. This is important because it maintains your work area (shipyard, office, warehouse, etc.) in a clean, professional, and safe manner. It promotes an efficient working environment, and it minimizes or prevents the discharge of **pollutants** into the environment.

Pollutants are objects, materials, chemicals, products, and/or waste that can contaminate air, water, and/or land, if released into the environment. Some examples of pollutants are foam coffee-cups, napkins, rags, paints, solvents, abrasive blast-grit, cigarette butts, cans or bottles. Anything can be a pollutant if it is disposed of in the wrong place.

GOOD ENVIRONMENTAL PRACTICES

EXAMPLE SITUATIONS

- ♦ Leaking equipment is one other example of poor housekeeping. If you discover leaking equipment, lines or hoses, you should take appropriate corrective action as soon as possible. Notify your supervisor or the appropriate maintenance department that the equipment requires repair. Clean-up any spilled or leaked material immediately if you are properly trained for clean-up.
- ♦ Small leaks may result in serious consequences. Another worker in the area could slip and injure him or herself. If not cleaned up, spills could run-off into a nearby storm drain, pier or dry dock basin, then ultimately drain into the surrounding water.

GOOD HOUSEKEEPING

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

- ♦ Keep the chemical product containers you are using in an organized manner, and under control. Keep the lids in place at all times, (even on empty containers), when you are not removing, adding or mixing product. Note: Empty containers should be separated and sent to the waste yard for scraping or disposal. Partial or full containers sometimes may be returned to inventory if the product still meets manufacturer's specifications.

- ♦ All grit blast material and paint overspray should be swept up and properly disposed as soon as practical. Wind and rain can come into contact with this material and can be transported into the local environment.

**GOOD
HOUSEKEEPING**
(Cont.)

NOTES:

OBJECTIVE

To identify the “secondary containment” requirements and systems to be used in the shipyard and promote their use in preventing hazardous materials spills and leaks. Also, to ensure that secondary containment systems are in place to catch accidental spills, leaks, and splashing of chemicals and wastes.

WHAT IS SECONDARY CONTAINMENT?

Secondary containment is the use of any practice, equipment or system that prevents spills or leaks from containers or equipment from getting into the environment. Secondary containment is used to catch accidental spills, leaks, and splashes, should the primary container or equipment leak, spill or puncture. The primary container is the drum, tank, or can that stores a material or waste. Secondary containers are found all over the shipyard. Drip pans, bermed areas, containment pallets and sand bags are examples of secondary containment systems. In the shipyard, secondary containment facilities can range from contained dry dock areas to tarps and liners to drip pans. Secondary containment systems can either be permanently installed or portable.

By breaking the “pathway” of the spill or leak to the ground or water, secondary containment prevents pollution and/or expensive clean-ups. It improves production efficiencies by reducing re-work, down-time and clean-up time when the work is done. Secondary containment should be used whenever storing, transporting or using hazardous materials or products.

EXAMPLES OF SECONDARY CONTAINMENT

- ♦ Material inventory racks with a sealed bottom and lips.
- ♦ Mixing paints in a designated area that is sealed and bermed.
- ♦ Dry dock troughs, dip pans, containment pallets, plastic tarps, paved and bermed areas, and sand bagging are all examples of shipyard secondary containment systems.
- ♦ Placing a plastic tarp and sand bag berm under and around portable equipment such as generators or air compressors.
- ♦ Containment pallets

SECONDARY CONTAINMENT

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

- ♦ Double walled piping and tanks.
- ♦ Drip pans under valve and pump connections during oil transfer operations.
- ♦ Using container over-packs during use or transport.
- ♦ When cleaning parts and equipment, use secondary containment system such as bermed plastic sheeting, drip pans or canvas tarps.
- ♦ Provide separation between secondary containment systems that contain incompatible hazardous materials or wastes.

**SECONDARY
CONTAINMENT**
(Cont.)

NOTES:

<p style="text-align: center;"><i>CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors</i></p>
--

OBJECTIVE

Provide an area where hazardous liquids can be stored that will help ensure potential spillage from containers such as paint cans, solvent drums, and oil drums does not soak into the underlying soils or enter nearby surface waters.

HAZARDOUS MATERIALS AND WASTES STORAGE

Dangerous liquid wastes or materials such as fuels, paints, solvents, acids, caustics, etc. should be stored in a area that can contain the material in the event of a spill or container leakage.

CONTAINMENT AREA CURB, DIKE, OR BERM

- ♦ The containment area should be surrounded by a curb, dike, berm that is sufficient to contain spills and leaks. The berm must be combined with an impervious surface, such as plastic, concrete and sealed asphalt. Ensure that the diking system makes a complete seal with the surface of the containment floor. For example, asphalt dikes/curbs need a sealer in-between the floor surface and the curb. If a sealer is not used, leaks can occur at the interface.

CONTAINMENT AREA SURFACE

- ♦ All paved storage areas should be free of cracks and gaps, and should be sufficiently impervious to contain leaks and spills until they can be addressed.
- ♦ Concrete is usually good for all types of hazardous materials and liquids.
- ♦ Asphalt is not always adequate for use as a surface to contain fuels or other hydrocarbons.
- ♦ Plastic surfaces should only be used when it is compatible with the materials stored

LIQUID STORAGE AREAS**NOTES:**

CONTAINMENT AREA CONTROLS

- ♦ Inside the contained area, the surface could be sloped towards a drain which is used to drain spills and rainwater. Some yards may choose to incorporate a blind sump in their containment area to recover spilled material. The blind sump is good for centralizing the spilled materials and utilizing a pumping system when appropriate.
- ♦ The drains in storage areas could have positive controls. For example, a closed drainage valve or plug (with management practices/procedures for controlling spills). When practicable, storage areas should have sloped roofs to minimize the amount of rainwater buildup inside the contained area.

LIQUID STORAGE AREAS

NOTES:

CONTAINMENT AREA VOLUME

- ♦ Ensure that the secondary containment to provide sufficient volume to help contain possible spills and leakage. In many shipyard situations, the volume of the containment is a function of shipyard policy.
- ♦ In some cases secondary containment volume is regulated. For example, large permanent tanks require that the volume of the secondary containment area should be 110% of the largest container or 10% of the total material contained, Whichever is Greater.

ENSURE THAT

- ♦ Storage of reactive, ignitable, or flammable materials will comply with all local and state fire codes.

LIQUID STORAGE AREAS

(Cont.)

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE

Ensure quick and safe response to hazardous materials spills in the shipyard.

WHY CLEAN UP SPILLS?

All chemical products and materials used in the shipyard need to be kept under control. A product under control is a material that has less chance to hurt people or the environment. A spilled product is a material “out of control.” Depending on the hazardous nature of the material, spills can result in fires, chemical burns, acute and chronic health problems and numerous other possible injuries to shipyard personnel. All spills will result in pollution if not properly cleaned up.

DETERMINING THE REQUIRED RESPONSE

Spills of materials or products in the shipyard will fall into one of two response categories. The first type is spills that can be cleaned up by area workers, without using special protective equipment or procedures. The second category of spills are those that require trained personnel, protective equipment and special procedures, to clean up. There are three important factors that determine to which response category a spill belongs.

These three important factors are:

- 1) The hazards of the spilled material.
- 2) The volume of the spilled material.
- 3) The location of the spill.

WHAT I NEED TO KNOW

REPORTING SPILLS TO ON-SITE MANAGEMENT

- ♦ Report spills above 5 gallons to on-site environmental personnel. Future reporting to regulators may be necessary.

CLEAR THE WORK AREA

- ♦ Clear the work area of employees they may be exposed to immediate threats such as fire, explosion or toxic fumes.

CHEMICAL SPILL RESPONSE

NOTES:

**CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors**

CONTROL THE SPILL

- ♦ Control the spread of the spillage if possible. Block the spill pathway to the ground, water, or storm drains. Do not attempt to stop the flow unless you know it can be done without putting yourself or other workers in jeopardy.

DISPOSE OF WASTE CORRECTLY

- ♦ Remember that when hazardous materials are spilled, the residue is always a *hazardous waste*. Never put spill clean-up materials into a trash bin. You must properly containerize the residue, label the container and transport to a storage facility for disposal.

EXAMPLE SITUATIONS

- ♦ A spill of a low hazard material, in a small amount, such as a few gallons or less of hydraulic fluid, in a location that is not an immediate threat to people or the environment, can be cleaned up by area workers.
- ♦ A large volume spill of a high hazard material, such as a 55 gallon drum of flammable solvent, in a location where people or the environment may be injured requires a quick response by trained personnel.

**CHEMICAL SPILL
RESPONSE (Cont.)**

NOTES:

OBJECTIVE

Identify specific hazards of chemicals used within the shipyard.

KNOW THE CHEMICAL HAZARDS IN YOUR AREA

Most of the chemicals found in shipyards fall into one or more categories: flammable; corrosives; toxics; and reactives.

Flammables

- ♦ Materials that pose a hazard because they readily ignite. These chemicals fall into a series of classes depending on their physical characteristics. A *Class I* flammable liquid is any liquid that has a flash-point below 100° F. A *Class II* liquid has a flash-point greater than 100° F. A *combustible* liquid has a flash-point above 140° F. Essentially, flammable chemicals usually can be ignited at normal room temperatures, while combustible chemicals must be heated to their flash-point temperatures before they ignite.

Corrosives

- ♦ Materials that usually cause the destruction of living tissue, like skin and eyes, during exposure. Similarly, they can cause the destruction of non-living materials such as wood and steel. Corrosives fall into three categories: *acids; bases; and solvents*. Acids cause burns because they react with the proteins, carbohydrates, and fats that compose living tissue. Bases, or caustic solutions, degrade the proteins and fat in the skin leading to desensitization and damaged tissue. Solvents can redden and roughen skin to the point of causing dermatitis.

Toxics

- ♦ Materials can damage your overall health, either immediately or after some period of time ranging from months to years. Exposures vary depending upon toxicity. Acute toxicity is an exposure in which the reaction to the exposure is immediately noticeable, or apparent within minutes/hours after the exposure. Chronic toxicity is opposite to acute. The response to the exposure is delayed, and may not be noticeable until months or years after the initial exposure. All materials can be toxic. It is the dose that determines the response.

CHEMICAL HAZARDS IN THE SHIPYARD

NOTES:

Reactives

- ♦ Materials can react violently or dangerously with other common materials such as air, water, or themselves (self-polymerizing). Water reactive materials will generate extreme heat and may explode when introduced to water. Air reactive materials will burn vigorously in air, and may also explode. Self-polymerizing materials will burn vigorously in air, and may also explode. Self-polymerizing materials are typically two-part (A/B) systems, that when mixed in disproportionate amounts, generate large amounts of heat.

MSDS AND CHEMICAL LABELS

All chemicals can be used safely if you understand the hazards and follow the rules of chemical safety. The first source of information on the chemical hazards of a product is the label. The label will identify the product, physical and health hazards, and safe use instructions. Always follow the manufacturer's instructions for storage and use.

The second source of information is the Material Safety Data Sheets ("MSDS"). The MSDS for a product will provide more detailed information on product hazards and procedures for safe usage. Review the MSDS prior to using any product for the first time, or if you are unsure about the hazards or proper safety precautions.

**CHEMICAL
HAZARDS IN THE
SHIPYARD
(Cont.)****NOTES:**

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

OBJECTIVE

To enlighten shipyard contractors about pollution pathway analysis and their local environmental surroundings. Shipyard personnel are to identify potential pollution pathways in their work-scope.

Within the shipyard there are a variety of chemicals and hazardous materials that can be transported to surface waters if an accident should occur. Accidents involving chemical or hazardous material spills can occur at any time or place in the shipyard. Areas that pose a significant risk are those which have direct pathways leading to adjacent surface waters.

All contractors must be aware of possible spill pathways. Storm drains are located throughout the shipyard. All storm drains discharge to adjacent surface waters. Only storm water is allowed to discharge into the storm drains (unless otherwise permitted by Environmental Engineering).

- 1) Air Pollution to Land Pollution**
- 2) Air Pollution To Water Pollution**
- 3) Water Pollution to Sediment Pollution**
- 4) Land Pollution to Water Pollution**
- 5) Solid Waste to Land Pollution**

Major potential water pathways are utility trenches, direct runoff channels, pier scuppers, sally ports, vessel decks, and unsealed manholes.

**POLLUTION
PREVENTION AND
POLLUTION
PATHWAY
ANALYSIS**

NOTES:

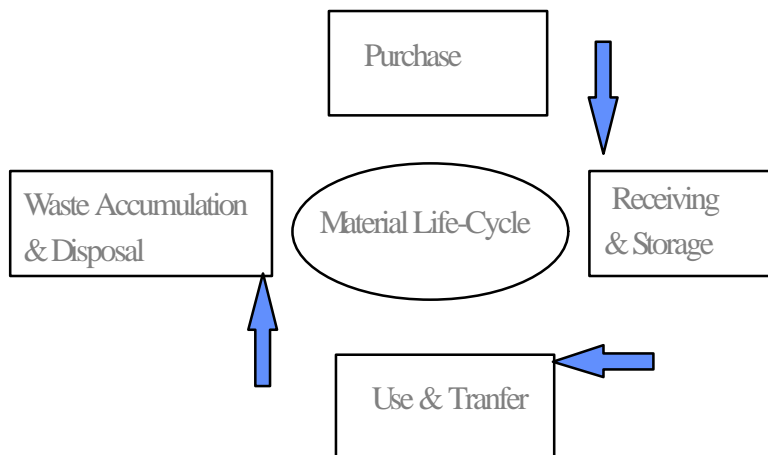
CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE

Increase personal safety and environmental preservation through the proper handling of hazardous materials.

THE HAZARDOUS MATERIAL HANDLING LIFE CYCLE

Material handling practices form the basis for environmental protection and worker chemical safety. Materials need to be handled in such a way that chemical products and other potentially hazardous materials do not get into the environment or cause exposures to workers. Examine the life cycle of materials in the shipyard and how each element of that life cycle has the potential to reduce the shipyard's costs and environmental liabilities.



MATERIAL PURCHASE

- ♦ Avoid ordering hazardous materials in amounts greater than needed for your specific job task. Any purchase savings realized by ordering in bulk quantities can easily be negated by the cost of disposing of unused out-of-spec materials. Avoid ordering excessively hazardous substances when a more “environmentally friendly” product can be used.

PROPER HAZARDOUS MATERIAL HANDLING

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

MATERIAL RECEIVING AND STORAGE

- ♦ Store material inventory by chemical compatibility. Provide secondary containment to prevent spills from contaminating other products or the environment. Follow good safety practices and use proper storage equipment to store drums or other bulk containers.

MATERIAL USAGE AND TRANSPORTATION

- ♦ Before transporting hazardous materials or products, ensure that the containers have secured lids or seals. Properly label the material to ensure the receiver can identify the shipment. Use nylon straps or rope, shrink wrap, containment pallets or other methods to reduce the potential for spills and accidents during transport. Do not overload the truck or forklift with more than a safely manageable quantity of product. Ensure deliveries are made to the correct work site and are staged in a safe location.

Material Transfers and Usage - Perform transfer and mixing operations only in designated areas, using secondary containment such as drip pans. When using pumps and hoses to transfer materials, always flush the lines before breaking connections. Place a drip pan or bucket under the connection when breaking down in order to catch any spillage. Label all personal use containers prior to transport from the transfer and mixing area to the job site use area. All containers must be properly sealed except when adding or removing material. Only prepare the amount you need to perform your current job task.

Material Disposal - Return any unused or excess material to inventory, if it still meets spec. Non-spec excess material should be returned to the appropriate department for consolidation and disposal. Never discard waste materials into trash or solid waste bins unless you are certain they are non-hazardous. If you are uncertain, get guidance from your supervisor or qualified shipyard personnel in the environmental or safety department.

Good material handling procedures and practices protect the environment, workers, and the shipyard, and its contractors by preventing chemicals from getting into the ground, air and water, or people.

PROPER HAZARDOUS MATERIAL HANDLING (Cont.)

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE

Eliminate the discharge of pollutants into the surface waters, storm drains, sewers, sinks, toilets, grounds or air.

UNDERSTAND “DUMPING” AND PREVENT IT

The discarding of pollutants by shipyard contractors into storm drains, surface waters, sinks and toilets, or onto the grounds is unacceptable and illegal. Pollutants consist of paints, solvents, oils, trash, abrasive blast material, detergents, etc. The dumping of pollutants into a storm drain means a discharge to adjacent surface waters. The dumping of pollutants onto the ground can enter surface waters by wind or rain runoff. If not cleaned up immediately liquid spills can soak into the soil and eventually reach surface and/or ground water. Dumping of pollutants not only includes directly discharging pollutants to the water, air or ground, but also includes irresponsibly placing the pollutant where it is likely to get transferred to the air, ground, or water.

WHAT IS A POLLUTANT?

- ♦ **Pollutants** are any material, chemical or product in the “wrong” place in the environment. In the shipyard, there are many materials that could be pollutants if they are “dumped” in the wrong place. These materials include paints, solvents, detergents, oils, greases, adhesives, abrasive blast, rags, trash, paper, cigarette butts, or any waste material not properly managed.

GOOD ENVIRONMENTAL PRACTICES

DO NOT DUMP INTO:

Surface Waters

- ♦ Many pollutants can damage the living species in our oceans, bays and rivers. Do not dump any pollutants into the surface waters!

Storm Drains

- ♦ All storm drains lead to surface or ground waters, not to treatment plants. Dumping pollutants into or near storm drains will result in their discharge to water or ground. Never dump pollutants or waste into storm drains!

NO DUMPING!

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

Sinks and Toilets

- ♦ Sinks and toilets discharge to a treatment plant or septic tank. Dumping pollutants into either results in pollutants getting into the environment, and is usually illegal as well. Do not dump pollutants or industrial wastes into sinks or toilets!

Facility Grounds

- ♦ Dumping pollutants onto the ground will result in their contamination of the soil, or transport by storm waters to surface waters. Clean up all spill immediately. Do not dump wastes or pollutants on the ground!

DUMPING IS ILLEGAL - BE RESPONSIBLE:

- ♦ All shipyard contractors shall be committed to preserving the waters and the environment. Contractors are asked to take part in this shipyard's commitment to preserve the environment by not dumping. Be aware that illegal dumping of pollutants is a violation of Federal and State Environmental Laws. Environmental regulating agencies will fine and/or imprison individuals and companies for illegal dumping.

NO DUMPING!

(Cont.)

NOTES:

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

OBJECTIVE

To minimize the release of vapors and dusts into the atmosphere, which may be harmful to employee health, public health, and the environment.

AIR QUALITY HEALTH CONCERNS

Shipyards utilize a wide variety of production operations and equipment for shipbuilding and repair that have the potential to release harmful fumes and dusts. Production processes include welding, painting, degreasing, abrasive blasting, and several other operations. In addition, production equipment such as boilers, internal combustion engines, and furnaces are an essential element of any shipyard and produce emissions. These shipyard operations and equipment produce air emissions that may adversely affect employee health, the public, and/or the environment. In some cases, emissions produced by shipyard operations and equipment are not considered immediate health risks to employees, especially when proper safety equipment is used. Also, public exposure to shipyard emissions is primarily location specific and usually considered minimal. However, it is always desirable to minimize air pollution due to compounding effects with outside emission sources such as other industries and automobiles.

SHIPYARD EMISSION TYPES

Several types of emissions generated by shipyard operations potentially include criteria pollutants and hazardous air pollutants (HAPs). Criteria pollutants are a major category of air pollutants that include Oxides of Nitrogen (NO_x), Carbon Monoxide (CO), Oxides of Sulfur (SO_x), Volatile Organic Compounds (VOC), Lead (Pb) and Particulate Matter (PM and PM₁₀).

PUT A LID ON IT!

Paints, thinners, solvents, degreasers, adhesives, sealant, etc. are just a few of the chemicals used by contractors in the shipbuilding and repair activities. Many of these chemicals emit vapors called Volatile Organic Compound (VOC) into the atmosphere. VOCs contribute to formation of smog in the atmosphere. There are simple and effective ways to prevent VOCs from being emitted into the air. Some examples are as follows:

- ♦ Put a lid on the container when you are not using the material. If you need to leave your work area for a tool, lunch, or any other reason, put the lid on.

VOCs AND OTHER AIR QUALITY CONCERNS

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

- ♦ Keep equipment covers closed. Keep degreaser, Safety-Kleen, and other cleaning equipment covers closed when not in use.
- ♦ Do not store brushes, rollers, etc. in covered solvent containers.
- ♦ Keep solvent and oil laden rag container covers closed.

KEEP DUST UNDER CONTROL:

Dust particles are commonly referred to as particulate matter (PM). PM emissions result from most shipyard operations including painting, welding, abrasive blasting, grinding and sanding. These emissions can have adverse effects on employee health as well as the environment. There are some easy steps that can be taken to minimize the amount of PM emission that become airborne.

- Use containment curtains to control dusts
- Use processes that produce less dust
- Perform dust generation activities in a manner that minimizes airborne dust
- Do not perform the operation in windy conditions or block the operation from the wind
- Keep area swept clean to minimize the likelihood of materials becoming airborne.

**VOCs AND OTHER
AIR QUALITY
CONCERNS**
(Cont.)

NOTES:

OBJECTIVE

Identify proper management of common shipyard wastes.

KNOW HOW TO MANAGE THE WASTE IN YOUR AREA

Proper management of waste is critical to the protection of the environment and the shipyard industry. Trash and solid waste disposal costs can have a large impact on the cost of the job. Improper disposal of hazardous waste can have even more serious consequences, ranging from fines to criminal prosecution. It is vital that all shipyard contractors know and use good waste management practices.

GOOD ENVIRONMENTAL PRACTICES

Contaminated Rags

Solvent, paint or oily rags must not be put in trash or solid waste containers. These waste materials must be placed in hazardous or segregated waste drums.

“Empty” Paint and Coating Cans

Do not pour any paint or coating residue into storm drains, sewers, sinks or on the ground. Excess material should be considered to be hazardous waste until qualified personnel make a “waste determination.” Empty cans containing a dried residue may also be hazardous waste, depending upon the contents and amount remaining. If practical, cans with no free liquid or dried residue should be recycled as scrap metal.

Used Oil and Lubricants

These wastes are often hazardous wastes but can usually be recycled if not contaminated with solvents or other hazardous wastes. They should be collected in designated drums or tanks, by type of waste material, and held for recycling or disposal.

Spent Solvents

Degreasing and cleaning solvents must never be disposed of in storm drains, sewers, sinks or trash bins. This includes not only chlorinated and petroleum based solvents, but also citrus and other “natural” biodegradable solvents. The solvent itself may be non-hazardous, but the spent solvent will contain the oil, grease, metals or other hazardous contaminants it picked up during use.

MANAGING COMMON SHIPYARD WASTES

NOTES:

Spent Blasting Media

Various types of blasting media are used in the shipyard. Large quantities of spent abrasive media are generated during exterior and interior vessel blasting. While the virgin blast material may be non-hazardous, the spent blast may contain toxic metals derived from the substrate and/or coating that was blasted. Do not dispose of spent abrasive blast into regular trash bins. Collect the spent media and store in designated areas or containers.

Scale and Wax

Scale is a mixture of paraffin type waxes, oils and oxidized metals, and is found in some types of vessel tanks. When it is removed during repair operations it becomes a “waste.” Scale should never be mixed with other wastes or trash. If a waste determination shows the scale to be hazardous, it must be managed as a hazardous waste. It can also be recycled in a fuel blending process for cement kilns or facilities that require high BTU fuels.

Shipyards, unlike production-line manufacturing facilities, produce a variety of wastes that can have considerable diversity in their characteristics. A waste that was non-hazardous one day could be a hazardous waste the next, depending upon the processes that generated the waste. It is important for all shipyard contractors to understand the basics of waste management and to take the proper precautions to ensure the correct handling of the wastes which are generated by their job tasks. When in doubt, always ask for guidance from your supervisor or qualified company personnel.

MANAGING COMMON SHIPYARD WASTES

(Cont.)

NOTES:

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

OBJECTIVE

Provide a summary of the environmental requirements for shipyard contractors.

ENVIRONMENTAL REQUIREMENTS FOR SHIPYARD CONTRACTORS - SUMMARY

INTRODUCTION - All shipyards are located at the meeting of land, air and water. This fact is driven by the nature of the work performed at, and by, shipyards. Shipyards also tend to perform work out-of-doors more often than other industries. Many of the job tasks performed by shipyard contractors may result in the release of pollution to the environment.

CONTRACTOR'S DUTY TO COMPLY -Every shipyard contractor has a duty to comply with all applicable environmental requirements. This duty is built-in to all subcontract agreements issued by the shipyard whereby the contractor or vendor agrees to perform their task in accordance with all applicable federal, state and local laws and regulations. This duty to perform all work in an environmentally safe manner is also a moral and ethical requirement of the contractor.

ENVIRONMENTAL LAW - Over the past 50 years, but mostly in the last 20 years, the federal government has passed many environmental laws. Most have been directed at the protection of one of the three specific media: air, land; or water. Due to the shipyard's location on at the interface of the three media, almost all environmental laws affect our operations.

GOOD HOUSEKEEPING - "Good Housekeeping" is the practice of maintaining a clean, well-defined work space. It means keeping the immediate area where you perform your work free of trash, debris, and other similar materials. This is important because it maintains your work area (shipyard, office, warehouse, etc.) in a clean, professional, and safe manner. It promotes an efficient working environment, and it minimizes or prevents the discharge of **pollutants** into the environment.

**ENVIRONMENTAL
REQUIREMENTS
FOR SHIPYARD
CONTRACTORS -
SUMMARY**

NOTES

CRAFTING QUALITY ENVIRONMENTS THROUGH GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors

SECONDARY CONTAINMENT - Secondary containment is the use of any practice, equipment or system that prevents spills or leaks from containers or equipment from getting into the environment. Secondary containment is used to catch accidental spills, leaks, and splashes, should the primary container or equipment leak, spill or puncture.

By breaking the “pathway” of the spill or leak to the ground or water, secondary containment prevents pollution and/or expensive clean-ups. It improves production efficiencies by reducing re-work, down-time and clean-up time when the work is done. Secondary containment should be used whenever storing, transporting or using hazardous materials or products.

HAZARDOUS MATERIAL AND WASTE STORAGE - Dangerous liquid wastes or materials such as fuels, paints, solvents, acids, caustics, etc. should be stored in a area that can contain the material in the event of a spill or container leakage.

SPILLS - All chemical products and materials used in the shipyard need to be kept under control. A product under control is a material that has less chance to hurt people or the environment. A spilled product is a material “out of control.” Depending on the hazardous nature of the material, spills can result in fires, chemical burns, acute and chronic health problems and numerous other possible injuries to shipyard personnel. All spills will result in pollution if not properly cleaned up.

CHEMICAL HAZARDS - Most of the chemicals found in shipyards fall into one or more categories: flammable; corrosives; toxics; and reactives. All shipyard and contractor personnel must understand the chemical hazards of the products they use. This information is vital for self protection during use of the product and also to protect the environment from pollution.

THE HAZARDOUS MATERIAL HANDLING - Material handling practices form the basis for environmental protection and worker chemical safety. Materials need to be handled in such a way that chemical products and other potentially hazardous materials do not get into the environment or cause exposure to workers.

UNDERSTAND “DUMPING” AND PREVENT IT - The discarding of pollutants by shipyard contractors into storm drains, surface waters, sinks and toilets, or onto the grounds is unacceptable

ENVIRONMENTAL REQUIREMENTS FOR SHIPYARD CONTRACTORS - SUMMARY

NOTES

***CRAFTING QUALITY ENVIRONMENTS THROUGH
GOOD ENVIRONMENTAL PRACTICES for Shipyard Contractors***

and illegal. Pollutants consist of paints, solvents, oils, trash, abrasive blast material, detergents, etc. The dumping of a pollutants into a storm drain means a discharge to adjacent surface waters. The dumping of pollutants onto the ground can enter surface waters by wind or rain runoff. Liquid spills, if not cleaned up immediately, can soak into the soil and eventually reach surface and/or ground water. Dumping of pollutants not only includes directly discharging pollutants to the water, air or ground, but also includes irresponsibly placing the pollutant where it is likely to get transferred to the air, grounds, or water.

AIR QUALITY HEALTH CONCERNS - Shipyards utilize a wide variety of production operations and equipment for shipbuilding and repair that have the potential to release harmful fumes and dusts. Production processes include welding, painting, degreasing, abrasive blasting, and several other operations. In addition, production equipment such as boilers, internal combustion engines, and furnaces are an essential element of any shipyard and produce emissions. These shipyard operations and equipment produce air emissions that may adversely affect employee health, the public, and/or the environment. In some cases, emissions produced by shipyard operations and equipment are not considered immediate health risks to employees, especially when proper safety equipment is used. Also, public exposure to shipyard emissions is primarily location specific and usually considered minimal. However, it is always desirable to minimize air pollution due to compounding effects with outside emission sources such as other industries and automobiles.

MANAGE YOUR WASTE - Proper management of waste is critical to the protection of the environment and the shipyard industry. Trash and solid waste disposal costs can have a large impact on the cost of the job. Improper disposal of hazardous waste can have even more serious consequences, ranging from fines to criminal prosecution. It is vital that all shipyard contractors know and use good waste management practices.

**ENVIRONMENTAL
REQUIREMENTS
FOR SHIPYARD
CONTRACTORS -
SUMMARY**

NOTES

Additional copies of this report can be obtained from the
National Shipbuilding Research and Documentation Center:

<http://www.nsnet.com/docctr/>

Documentation Center
The University of Michigan
Transportation Research Institute
Marine Systems Division
2901 Baxter Road
Ann Arbor, MI 48109-2150

Phone: 734-763-2465
Fax: 734-763-4862
E-mail: Doc.Center@umich.edu